Project Name: COSC2196 – Assessment 2: Team Project

Due Date: 18/10/2020 at 11:59PM

Team Members

Name	Student Number	Contact information
Adam Mutimer	S3875753	S3875753@student.rmit.edu.au
Channon Harper	S3871491	S3871491@student.rmit.edu.au
Daniel Scarfe	S3872217	S3872217@student.rmit.edu.au
Jorge Esteban	S3874914	S3874914@student.rmit.edu.au
Madeleine Dupree	S3879009	S3879009@student.rmit.edu.au
Samuel Mennen	S3876937	S3876937@student.rmit.edu.au

GitHub Pages Link: https://daniel-scarfe.github.io/COSC2196_A2/

GitHub Repository: https: //github.com/Daniel-Scarfe/COSC2196_A2

CONTENTS

THE FIGHTING MONGOOSES

Mission Statement

Our mission is to unlock our full potential in the field of information technology, by gathering, compiling and sharing our knowledge and information within our group and those who seek it. To learn new skills and further others to proficiency in our chosen specialised fields. We have come together as The Fighting Mongooses with the ambition to fulfill this task without hesitation or fear, just like a wild mongoose.

Our Team

Adam Mutimer
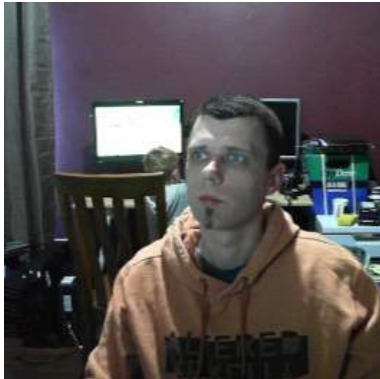
Daniel Scarfe

Madeleine Dupree

Channon Harper

Jorge Esteban

Samuel Mennen

IDEAL JOBS AS A GROUP

IT Skills

Ranking system 1-10 how important skill is to ideal job. 10 being must have, 5 being basic knowledge, 1 being not required.

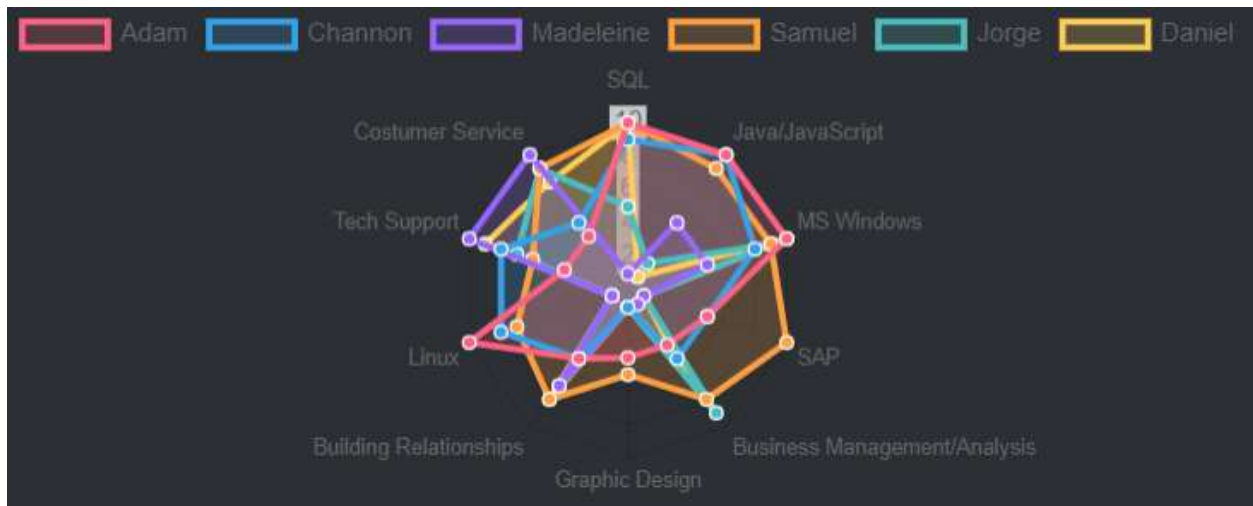Figure 1: Burning glass technologies ranking 2018

Generic skills

Ranking system 1-10 how important skill is to ideal job. 10 being must have, 5 being basic knowledge, 1 being not required.
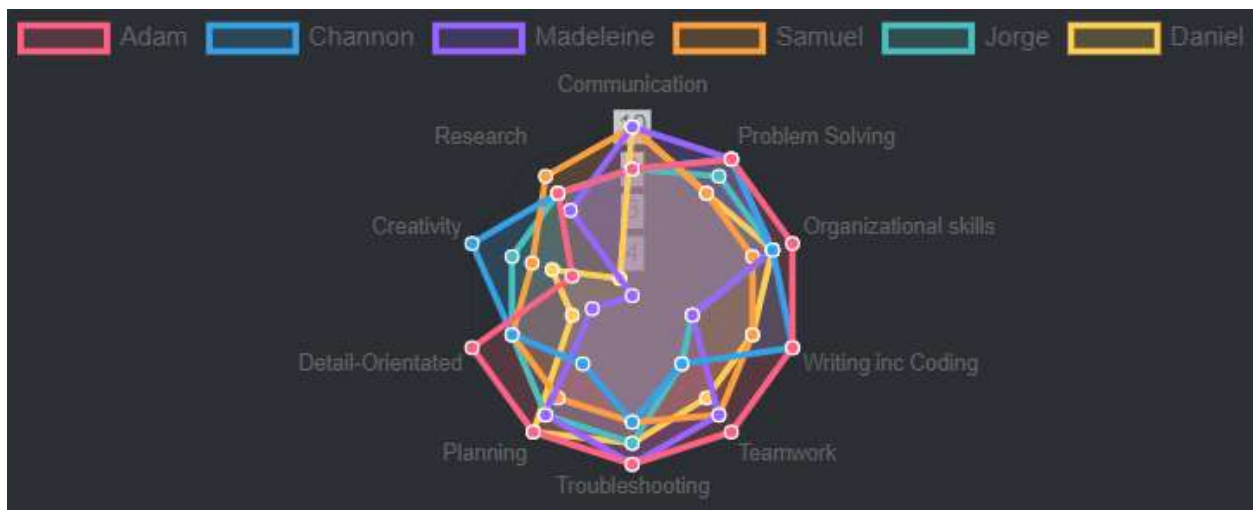

Figure 2: Burning glass skills ranking 2018

Adam's Ideal Job: Backend Developer

My Ideal Job would be a Backend Developer. A Backend Developer in simple terms is a lot like a builder; they build a house from the foundation to the structure (framework). They would then hand off to the Frontend Developer - or in the case of a builder, an Interior Designer - who's focus is on the customer facing aspects of the development or in other words what people are going to see.

I find the role of a Backend Developer appealing as its more orientated to the work I find most appealing and interesting, however I am also comfortable with Frontend Development as the two roles do require quite a bit of crossover. The roles can also be combined into a single role which is called Full Stack Developer but again even though I have a lot of the skills required to be a Full Stack Developer, I prefer the complexities of Backend Development work as to be perfectly honest we make the real magic happen.

My Chosen career path is very different from my fellow teammates, being they are more support and frontline orientated positions and will not require in-depth knowledge or programming, databases, etc. However, their will be some crossover in skill sets at a minor level. Channon's chosen field of cyber security would have more crossover in skills with my chosen field as Backend Developer as I would also need to take into account certain aspects of cybersecurity during development stages to ensure the application is secure and will work appropriately with other security steps taken externally to the application. Channon would also require some programming skills and to some extent knowledge of database operations and management.

Channon's Ideal Job: In Cyber Security (field yet to be determined)

My ideal job will be in one of the fields of Cyber Security. The positions in cyber security vary in their own ways but keep the same basic knowledge under them. My main reasoning for this is to protect from any cyber-attacks that are occurring or may occur in the future, to stay ahead of the hackers and implement fixes to prevent any intrusion. It holds a lot of the skills I find interesting and enjoyable with the main one being the languages behind programming and how they can be manipulated. I believe taking a role in this field will be beneficial as we all depend on secure systems and the knowledge to achieve this will be highly sought after.

I believe my Ideal Job holds similarities to Adams as it has a lot of programming language based knowledge. There is some overlap of similarities with the others however the main goals are very different. To my understanding Maddie's, Daniel's, Sam's and Jorge's all hold very similar aspects of work.

Daniel's Ideal Job: Systems Administrator

My ideal job is a Systems Administrator for a City. It involves working on a Network Services team, providing administration and technical support of server infrastructure and project management for upgrades as well as providing back up support. It involves computer networks in a government environment. Administering and developing corporate systems, servers, databases, and data storage interests me. As well as ensuring the integrity and availability of data and email systems. There is also planning and developing server, storage, backup, disaster recovery, and network infrastructure solutions. The position of a Systems Administrator is very different to Adam's ideal job of a Backend Developer and Channon's ideal job of Cyber Security Analyst as they are predominantly software focused. There are similarities to Madeline's ideal job of IT support officer which also provides technical support and IT systems maintenance. There is also a lot of crossover with Sam's ideal job of System Integration Officer as it too involves working with IT systems and networking, as does Jorge's ideal job of IT Support Specialist.

Jorge's Ideal Job: IT support specialist

My ideal job would be to become an IT support specialist. I chose this job because I think this is a great job for someone with my skills. I think this is a great job to start a career in the IT industry. I have a lot of experience talking to customers and answering their queries.

IT experience for IT support specialist is between 3-5 years

As of 2020 there are 9748 IT support specialist] positions available according to Seek.

IT Support Duties & Responsibilities of the Job

When compiling an IT Support job description, here is a selection of duties to include:

- Installing and configuring computer hardware, software, systems, networks, printers and scanners
- Monitoring and maintaining computer systems and networks
- Responding in a timely manner to service issues and requests
- Providing technical support across the company (this may be in person or over the phone)
- Setting up accounts for new users
- Repairing and replacing equipment as necessary
- Testing new technology
- Possibly training more junior staff members

IT Support job qualifications and requirements

Although a formal degree might not always be necessary in an IT Support role, tertiary qualifications can include the following:

- Computer Science
- Computing
- Engineering

There are also several qualities that candidates should be expected to display:

- A technical, logical thought process
- Problem-solving skills
- An ability to stick to strict deadlines
- An ability to prioritise and delegate
- A keen eye for detail

How does my job compare to my team members?

In regards in how my job compares to my other team members. Adam and Channon have very different career paths compared to Daniel, Madelaine and Samuel. Channon and Adam are more orientated in the back end of software and data analysis, while the rest of us are more inclined towards the front end of things like talking to customers, management and service.

Madeleine's Ideal Job: IT Support Officer

My ideal job is to provide IT support to fellow staff members at SANE Australia. This requires a lot of problem-solving skills, an understanding of Mac computers rather than Windows and very little programming skill.

This is quite different to Adam's ideal job as he wishes to work behind the scenes as a backend developer, building the framework of the software he creates. The job I chose does not involve this sort of creativity or programming skill. Channon's ideal job is similar to Adam's in that it requires a lot of knowledge of programming languages and creativity, unlike my job selection.

I think my job is similar to Daniel's as he also chose a job that is based around providing IT support, though his ideal job does involve more responsibilities than mine, such as project management and development of the systems used by the company/government. I would say my ideal job is similar to Sam's in that we both can see the reward in working to help others access the community/healthcare. However, Sam's job revolves around developing, maintaining or enhancing business applications, whereas mine job is to provide more general support for colleagues. I think my ideal job is most similar to Jorge's ideal job because we both wish to work in IT support.

Samuel's Ideal Job: System Integration Officer

My ideal job is as System Integration Officer. Specifically, integration for people with impairments such as vision or auditory as well as other disabilities. The integration officer's main objective is to seamlessly integrate humans and technology by developing, managing and maintaining integration systems. This requires the integration officer to have a broad range of knowledge across a variety of IT systems and combines elements of both front-end and back-end development as well as an understanding of business practices and people. A strong focus on data manipulation and automated systems is essential for any position as an integration officer.

As the system integration officer is required to work alongside all facets of information technology, both technical and user focused, the skills necessary overlap with many of my Fighting Mongoose colleagues' ideal jobs. Adam (as a backend developer), Channon (as a cyber security officer) and Daniel (as a systems administrator) all have technical focused ideal jobs. A strong knowledge of database systems and structure is essential for all these occupations and technical aptitude in networked systems. Jorge and Maddie's ideal jobs (both as IT support) also share similar skill sets with integration officers as both roles require direct communication with user-end clients. The main difference of a systems integration officer compared to the ideal jobs of my colleagues is that the integration officer is largely responsible for developing and maintain the tools that allow both sides to work together.

The most important baseline skills for integration officers, communication, ranks highly among my colleagues. As communication is the most in demand baseline skill based on Burning Glass Technologies' data this is no surprise. Furthermore, required baseline skills in problem solving, teamwork and organisational skills also rank highly amongst my colleagues and myself. Perhaps my required baselines skills lean more towards Maddie and Jorge's ideal jobs as both integration officers and IT support staff communicate heavily with user-end clients and business management.

As the required skills were similar to those of my colleagues, a wide variety of skills is essential to assimilating to a team environment. Acting as an integration officer requires me to work alongside both front-end and back-end teams as well as finding solutions with clients and business entities.

TOOLS

Microsoft Teams

Microsoft Teams: The Fighting Mongooses

Meetings & Documents: Link

SharePoint: Link

Comments:

Microsoft Teams was used as the primary means of communication and collaboration for our team, all project deliverables besides the website were initially delivered to the various sub sections as files, then later when completed uploaded to the master branch of our GitHub repository.

GitHub Repository

 Daniel-Scarfe/COSC2196_A2 - Master Branch
 Daniel-Scarfe/COSC2196_A2 - Website Branch

GitHub Commit History:

 Daniel-Scarfe/COSC2196_A2 - Master Branch Commits
 Daniel-Scarfe/COSC2196_A2 - Website Branch Commits

Figure 1: Data Source: GitHub - Repository Insights (Monthly)

Comments:

Our GIT audit trail does not accurately reflect our groups work overall as a lot of deliverables were created in word and submitted to the relevant sub channel on Microsoft Teams, which were then converted to html to suit the website design. So, in short, the GIT audit trail more accurately reflects the website development and not the overall work completed by the team and its members.

Discord Discussion History

Discord Server: Link

Discord Archive: Text Channels / general

Comments:

Discord was used as an "out of band" communications tool for general discussions of minor issues and ideas for the website that were too minor in nature to present at a meeting, general feedback and support amongst team members, and some off-topic discussions. It is included here for the sake of completeness.

Extended Team Member Information:

Name	Student ID	Assignment 1/Profile	GitHub
Adam Mutimer	(s3875753)	COSC2196 - Assessment 1	GitHub: AdamM-AU
Channon Harper	(s3871491)	COSC2196 - Assessment 1	GitHub: Channon87
Daniel Scarfe	(s3872217)	COSC2196 - Assessment 1	GitHub: Daniel-Scarfe
Jorge Esteban	(s3874914)	COSC2196 - Assessment 1	GitHub: jorge23051985
Madeleine Dupree	(s3879009)	COSC2196 - Assessment 1	GitHub: MaddieDupree
Samuel Mennen	(s3876937)	COSC2196 - Assessment 1	GitHub: SammyWo

MEETINGS

MEETING LINKS

Meeting 1 (26/09/2020):	• Microsoft Teams - High Resolution Video • Microsoft Teams - Agenda Document • Microsoft Teams - Actions Document • GitHub - Low Resolution Video • GitHub - Agenda Document • GitHub - Actions Document
Meeting 2 (27/09/2020):	• Microsoft Teams - High Resolution Video • Microsoft Teams - Agenda Document • Microsoft Teams - Actions Document • GitHub - Low Resolution Video • GitHub - Agenda Document • GitHub - Actions Document
Meeting 3 (30/09/2020):	• Microsoft Teams - High Resolution Video • Microsoft Teams - Agenda Document • Microsoft Teams - Actions Document • GitHub - Low Resolution Video • GitHub - Agenda Document • GitHub - Actions Document
Meeting 4 (07/10/2020):	• Microsoft Teams - High Resolution Video • Microsoft Teams - Agenda Document • Microsoft Teams - Actions Document • GitHub - Low Resolution Video • GitHub - Agenda Document • GitHub - Actions Document
Meeting 4 - Github Tutorial (07/10/2002):	• Microsoft Teams - High Resolution Video • Microsoft Teams - Agenda Document • Microsoft Teams - Actions Document • GitHub - Low Resolution Video • GitHub - Agenda Document • GitHub - Actions Document
Meeting 5 - Minor Meeting (10/10/2020):	• Microsoft Teams - High Resolution Video • Microsoft Teams - Agenda Document • Microsoft Teams - Actions Document • GitHub - Low Resolution Video • GitHub - Agenda Document • GitHub - Actions Document
Meeting 6 (14/10/2020):	• Microsoft Teams - High Resolution Video • Microsoft Teams - Agenda Document

	- Microsoft Teams - Actions Document - GitHub - Low Resolution Video - GitHub - Agenda Document - GitHub - Actions Document
Meeting 7 (17/10/2002) (8am AEDT):	- Microsoft Teams - High Resolution Video - Microsoft Teams - Agenda Document - Microsoft Teams - Actions Document - GitHub - Low Resolution Video - GitHub - Agenda Document - GitHub - Actions Document
Meeting 8 (17/10/2020) (8pm AEDT):	- Microsoft Teams - High Resolution Video - Microsoft Teams - Agenda Document - Microsoft Teams - Actions Document - GitHub - Low Resolution Video - GitHub - Agenda Document - GitHub - Actions Document

INDUSTRY DATA

Comparisons to Burning Glass

IT Skills

Skills in demand as percentile ranking, Ideal Jobs having skill as ranking 1-10. 10 being must have, 5 being basic knowledge, 1 being not required.

The skills were worked out by taking Data from Burning Glass and dividing amount of Jobs that have filter by the Total postings it was applied to. Then was given a ranking system working with the highest percent 13% as 10 and scale down to lowest 5% at index value 6 each number represents a difference of 2% of total. The top 11 skills from Burning Glass were selected with a couple getting averaged out.

Figure 1: Burning glass technologies ranking 2018

Generic skills

Skills in demand as percentile ranking, Ideal Jobs having skill as ranking 1-10. 10 being must have, 5 being basic knowledge, 1 being not required.

The skills were worked out by taking Data from Burning Glass and dividing amount of Jobs that have filter by the Total postings it was applied to. Then was given a ranking system working with the highest percent 36% as 10 and scale down to lowest 6% at index value 5 each number represents a difference of 6% of total. The top 10 skills from Burning Glass were selected.
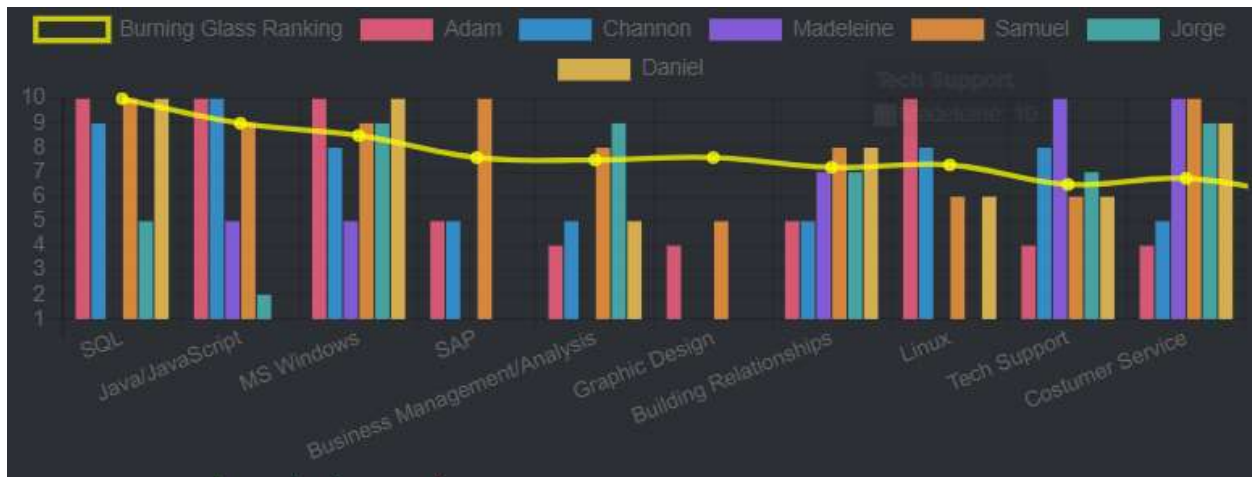
Figure 2: Burning glass skills ranking 2018

Reflection of Data

The above data is a good reflection as to our Ideal Jobs skill requirements and the Skill sets that are sought after from job listings. It does not however denote the skills that each individual will achieve from the study path they are undergoing to achieve their Ideal Jobs. From the above data we can see as a team we have the Generic Skills covered, with some IT Skills lacking to some in their Ideal Jobs that are covered by others. Graphic Design was the only real downfall however as stated previously the data above is not a reflection of skills each person would have acquired. So as a end note the team we have put together THE FIGHTING MONGOOSES will have no problems conquering any task.

Adam's job title - Backend Developer

The demand for Backend Developers is currently moderate to high there is currently 649 available positions advertised in Australia on seek.com.au (15/10/2020). Seek.com.au estimates this role has a growth rate of 23.4% over the next five years. My skills will not be suitable for every one of the 649 positions without learning some additional skills. My skills are also transferable to another position known as a Full Stack Developer (Frontend & Backend Developer), So Job opportunities will definitely be available now and in the future as long as my skill set is kept up to date.

Skills for Job

No IT role comes with a permanent set of skills as Industry is forever changing, however each role has a good basis of skills on which they grow. Currently the skills wanted and required for my chosen role are as follows.

IT Skills

- Programming Languages: JavaScript, Java, C, C#, C++, PHP, Python, Node.JS
- Databases: MySQL, PostgreSQL, MongoDB, Cassandra, DynamoDB
- In Depth Knowledge & Understanding of Frameworks: TWIG, Bootstrap, Angular
- In Depth Knowledge & Understanding of Application Programming Interface / APIs
- Microservices
- Cloud Services: AWS, Azure, Google Cloud
- Linux Administration and Management
- Microsoft Windows Desktop / Server Administration and Management

General Skills

- Problem Solving Skills
- Attention to detail
- Communication Skills
- Time Management Skills
- Ability & Willingness to Learn Quickly

IT Skills

The burning glass data in relation to IT skills, Database/SQL is ranked #1 while programing languages vary with JavaScript at position 2, Java position 3, Microsoft Windows #4, C# position 12, Linux position 13. This data indicates positions with this required skill set were highly sought after in 2018.

General Skills

General / Generic skills for this role are highly sought after and all fall in the top half of the burning glass data as Communication Skills ranked at number 1, Problem Solving ranked at number 2, Detail-Orientated ranked at number 8, Time management ranked at number 12 and Research ranked at number 10.

Has my opinion changed?

In relation to positions and the burning glass data Backend Developer is not listed in the data supplied, however Front End Developer is ranked at 6th position, Web Developer ranked at 15th, Full Stack Developer is ranked at 17th position and a PHP Developer is ranked at 24th position all jobs with a similar skill set to each other and to the position of a Backend Developer.

After reviewing the burning glass data my opinion on my idea job has not faltered as job prospects remain high in the role and there are plenty of carryover roles for the required skills to move into in the future should employment as a Backend Developer becomes harder to find.

Channon's job title - Cyber security (field yet to be determined)

In terms of demand they are pretty highly sought after with currently cyber security professional's shortage will hit 3.5 million globally by the end of 2021. There are many different fillable roles in the field of cyber security and i am yet to decide exactly what path i wish to take however most skills are transferable so getting the basics of what i need to learn out of the way initially will guide me further as to what role i wish to take. I am currently liking the outlook of Cryptographer, Security engineer and Penetration tester.

Skills for Job

The skills required are both hard and soft skills currently i am working on getting the hard skills done by completing a course through RMIT i should be able to atleast have the basic underpinning to the knowledge i need. From there will look into certifications if needed however a general understanding i find to be more imperative at this point in time.

IT Skills

- All programming languages understandable
- Basic business acumen
- Fundamental Computer Forensics Skills
- Technical Aptitude
- An Understanding of Hacking
- Knowledge of Security Across Various Platforms

General Skills

- Problem-Solving Skills
- Attention to Detail
- Communication Skills
- A Desire to Learn
- Enthusiastic, analytical, and adaptable Personality

IT Skills

IT skills ranks overall very highly on the demand from employers. With alot of the top statistics from Burning Glass being all relevant to the field i wish to pursue.

The three highest that are not in the skill set I would need are Graphic design, Building relationships, customer service

General skills

In terms of demand once again they rank very highly on burning glass data with a lot of the skills required are listed at the top. The three highest ranked which are not required depending how you look at it would have to be Mentoring, presentation skills, and management.

Has my opinion changed?

Having looked at the data my opinion for my ideal job has not changed. I have however changed the outlook from my original Ideal job to a field to be decided in the future. Although I'm still undecided to what specific role I want to take in cyber security I believe it is the future of where everything is heading. I also anticipate that the skills I gather to achieve my role in Cyber Security will also be viable in many other fields of IT.

Daniel's job title - Systems Administrator

Employer Demand: Systems Administrator was 8th on the list of Burning Glass data on Top Job Titles listed for Information Technology, out of 25. The most in demand job title of Solutions Architect had 45% more postings.

Skill Set Required:

General Skills

- Organisational and planning skills.
- Conceptual and analytical skills.
- Problem Solving and interpersonal skills.
- Verbal and written communication skills.

IT Skills

- Windows server and workstation operating systems (Administration).
- SQL Server databases (Administration).
- Microsoft Exchange / Exchange Online / Office 365 (Administration).
- Networking and server trends and standards / Network management.
- Customer service skills / PC Support.

Most of the General skills in my required skill set ranked at the very top in terms of demand from employers with Communication, Problem Solving, Organisational and Writing rounding out the top four. Planning was number seven and Analytical skills were the least in demand with only 7% of the demand of Communication skills.

The three highest ranked general skills which are not in my required skill set are Team Work / Collaboration, Troubleshooting and Detail Oriented.

A couple of the IT-specific skills in my required skill set rank highly in terms of demand from employers including SQL that is the most in demand skill and Windows at number four on the list. Customer service, Technical Support and Microsoft Office were further down the list. I couldn't see Networking on the list. The three highest ranked IT-specific skills which are not in my required skill set are JavaScript, Java and Project Management.

Having looked at the Burning Glass data, my opinion of Systems Administrator as an ideal job has not changed. This is because there still appears to be adequate demand for the job and very high demand for most of the general skills required and sufficient demand for the IT skills required. This leads me to believe switching jobs in the future within IT would be quite feasible with my required skill set being varied and overall in demand. Beginning a career in Systems Administration should not be a burden on future job prospects and will in fact leave me with a strong foundational skill set.

Madeleine's Job title: IT Support Officer

My ideal job selection is not listed in the Burning Glass data as one of the top job titles. This is surprising to me as I would have predicted that IT support jobs would be very common in this industry. Perhaps the Burning Glass data is not categorising the most common job titles but rather the most valued or highly paid job titles. If that is the case then it is understandable why IT support workers are not listed here. Unfortunately, it is very unclear what the Burning Glass data is really about as it does not explain itself. I did try to look into finding better or clearer data on this topic but could only find predictions for the most in demand IT jobs or the highest paying IT jobs, no data on what is realistically in demand or common. I chose to use the Burning Glass data here anyway.

Here are the IT skills that are listed in the Burning Glass data that I will require in my ideal job, listed from most to least in demand:

- Technical support
- Customer service
- Microsoft Office

Here are some other IT skills that are required for my ideal job that are not listed in the Burning Glass data:

- Data security maintenance
- Understanding of Mac, Helpdesk, Box, SharePoint, Microsoft 365, Asana
- Testing
- Computing and administration

- Technical support
- These are the three highest ranked IT skills from the Burning Glass data which are not required in my ideal job:
- SQL
- JavaScript
- JAVA

Here are the generic skills that are listed in the Burning Glass data that I will require in my ideal job, listed from most to least in demand:

- Communication skills
- Problem solving
- Organisational skills
- Writing/written or verbal communication
- Teamwork/collaboration
- Troubleshooting
- Planning
- Research
- Time management
- Mentoring/training/coaching
- Team building
- Multi-tasking
- English
- Building effective relationships
- Articulate

Here are some other generic skills that are required for my ideal job that are not listed in the Burning Glass data:

- Customer service
- Empathy
- Can work independently
- Can work under pressure
- Flexibility
- Cultural understanding
- Building relationships

These are the three highest ranked IT skills from the Burning Glass data which are not required in my ideal job:

- Detail-Oriented
- Creativity
- Leadership

Having looked at the Burning Glass data, has my opinion of my ideal job changed? Why or why not?

No, my opinion has not changed. The skills required for my ideal job are still much more than I have now, so there is plenty of improvement for me to make. There is also no need for me to work under a highly paid or highly sought-after job title if I enjoy the work otherwise. As far as I can tell there are plenty of IT support jobs available despite the data supplied by Burning Glass. Plus, if I choose to work for a great organisation like SANE Australia in the future then I will be very grateful.

Samuel's job title - Systems Integration Officer

My intended career is as a Systems Integration Officer. A Systems Integration Officer specialises in bringing together several systems to function together. Specifically, to ensure seamless integration of human interaction and technology. While not particularly focusing on any one field, a broad range of knowledge of different systems is in order, both technical and interpersonal. Many of these skills are ranked highly on Burning Glass Technologies' labour insight findings (2018).

Required general/ baseline skills (Top 10):

- Communication skills (1): Very high
- Problem Solving (2): High
- Writing (Including code) (4): High
- Teamwork/ Collaboration (5): Very high
- Troubleshooting (6): High
- Detail-oriented (8): High medium
- Creativity (9): Medium
- Research (10): High
- Quality Assurance (15): Very high
- Analytical Skills (19): High

Non-Required Baseline skills:

- Leadership (11)
- Mentoring (13)
- Self-starter (24)

Required IT specific/ Specialised Skills (Top 10):

- SQL (1): Very high
- JavaScript/ Java (2): High
- Microsoft windows (3): High

- Project Management (5): high
- SAP (6): Very High
- Technical Support (12): High
- Customer Service (15): Very high
- Website Production (18): high medium
- Git (21): High medium

Non-required Specialised Skills:

- Microsoft C# (13)
- Python (22)
- SCRUM (23)

While the position as Systems Integration Officer does not appear on the top 25 list on Burning Glass Technologies' findings, the skills necessary are highly transferrable to other roles. Pursuing a career as a Systems Integration officer still affords the opportunity towards a variety of other roles.

Predictably, the broad range of skills necessary for my ideal job match many of the skills of the ideal jobs of my colleagues in The Fighting Mongooses. Furthermore, because an integration officer's role is to provide seamless interaction between humans and technology, many of the skills help with the transitions between each of my colleagues' roles.

The most important technical skills for integration officers, SQL and Java is similar to the roles that Adam (as a back-end developer), Channon (as a cyber security officer) and Daniel (as a system administrator) a required. Skills in business management and analysis are similar to Jorge's (as IT support) ideal job. Maddie's (as IT support) required skills in customer service are also synonymous with my ideal role. What separates my ideal job from others is skills in SAP which deals largely in automated systems which are essential in technological integration.

The most important baseline skills for integration officers, communication, ranks highly among my colleagues. As communication is the most in demand baseline skill based on Burning Glass Technologies' data this is no surprise. Furthermore, required baseline skills in problem solving, teamwork and organisational skills also rank highly amongst my colleagues and myself. Perhaps my required baselines skills lean more towards Maddie and Jorge's ideal jobs as both integration officers and IT support staff communicate heavily with user-end clients and business management.

As the required skills were similar to those of my colleagues, a wide variety of skills is essential to assimilating to a team environment. Acting as an integration officer requires

me to work alongside both front-end and back-end teams as well as finding solutions with clients and business entities.

IT WORK

Interview Video:

https://web.microsoftstream.com/video/765f76f3-a55b-421f-b7a2-6ced4c07bc1c

Interview with Steven Spiller. Senior Software Engineer Xbox Microsoft.

The Fighting Mongooses had the opportunity to interview Steven Spiller, a senior software engineer for Microsoft, specifically for the Xbox platform. Even though the upcoming release of the new Xbox was quickly approaching, and Steven being extremely busy, we greatly appreciate the time Steve took to meet with us and we are extremely grateful for the knowledge and passion that he shared with us.

Interview Questions:

1. Please tell us about your IT work. What exactly do you do?
2. Please tell us about the industry you work in?
3. What other kinds of work do you have to do?
4. Who are all the different people you interact with in your work? Please tell us about them.
5. Please tell us about your interactions with other IT professionals?
6. What about your interactions with clients or investors?
7. What aspects of your work do you spend the most time on? Please tell us about these?
8. Which aspects of your work do you find most challenging?
9. Can you share an example of the work you do that best captures the essence of the IT industry?
10. Daniel: Do you work from home at all and if so, do you prefer it to working in the office? Or if not, would you like to work from home at least some days?
11. Adam: What aspect of your work do you find most enjoyable and why?
12. Maddie: What advice would you give to someone who is just beginning to study or work in the IT industry?
13. Channon: Do you find it hard keeping skills/learnings up to date?
14. Jorge: What do you think are the most important skills and attributes for a job like this?
15. Sam: What new skills do you think will be in demand in the industry in 5 years?

Interview Transcript:

1. Please tell us about your IT work. What exactly do you do?

My name is Steven Spiller. You can just call me Steve. I work as a senior software engineer for Xbox/ Microsoft. I work in a little team is called, well not so little anymore, but it's called ATG, the Advanced Technology Group. Our role in the organization is to help game developers make the best use of the platform of Xbox. Specifically, I work in networking and multiplayer systems. If titles are having trouble or they need advice, or they are behind this severely behind and they can't get their stuff to work on our platform. Our team is the one that helps them out. It's not as interesting on the networking multiplayer side, but the on the graphics side. Those are the guys that really help titles tune on our platform so they'll be able to take traces of the games running, evaluate them, and offer back tips that can help them run faster so they'll get games to run at least in the previous generation all the way at 1080p instead of only 900p. Things like that. So really our goal is to make all the titles that run on Xbox the best they can be on Xbox. I think that was our motto at one time.

2. Please tell us about the industry you work in?

Being at Microsoft, I've done a lot of things in a lot of different areas, but most recently we can just stay with video games industry, so the Xbox stuff is what I've been working on since 2013. So the last seven years. Microsoft provides platforms and services for game developers. It is a fairly large industry. You've got billions of dollars and millions of millions of gamers across the across the world and that's what we're trying to do. We're trying to make things better and easier for gamers across the entire world. Like a panacea of the world. Good way of saying that, but we want to make everybody's life easier.

3. What other kinds of work do you have to do?

In my role, I'll do things like answer simple questions on a developer forum that is specific for Xbox Partners. If they have issues, that's one of the first places they'll go, so I'll do a little time answering those, and those can be from really simple questions like "Is this supposed to work like this too?" "Hey, we're getting a crash in this very strange situation." "Can you help us figure that out?" I will investigate issues that have been reported by external developers. I work directly with the platform team, the people that actually wrote all the code. I work with them to get things figured out and resolve bugs, find gaps in our solutions. I've also developed samples and demonstrate best practices for using the platform and our services. For example, if you want to know how to do multiplayer matchmaking through Xbox Live, we have specific examples and lots of documentation that I put together to help with that. Then of course if people still have issues and they can come straight to us. Because we do work straight not just from forums. We will also engage via email, a lot more on teams lately, over the phone and video conferencing. We also go on site with developers to help them get issues resolved or to help them get their game

working on Xbox. I've done that several times. Which is it's kind of fun. It's very busy though. We also deliver content for (what used to be) in-person conferences. We had to cancel the last few and turn them into digital only. I don't know what the future holds as far as those go. We have several annual conferences. Directed around Xbox developers in gaming and we provide educational training and. We've done discussion sessions where people actually come out, listen to us and talk, which is kind of fun.

4. Who are all the different people you interact with in your work? Please tell us about them.

Yes, I do a lot of different things as you could tell right? And those have different people I work with, so when we're developing new samples, we want them to have a consistent look and feel. We actually have designers, graphic designers that help us design the UI flows and figure out what the scenarios that we want to show. Program managers, we actually call them the butt on the line. These are the people that own features and are responsible for making sure that their status is tracked correctly and that they're (the team) doing the right thing. All that work other software developers obviously, and then we have another special type of person in the Xbox Organisation that we call developer account managers (DAM). These are the people that actually own the relationship with the different publishers. We have one person that owns Electronic Arts. When Electronic Arts has any sort of problems, they need to do something, they want to ask about future plans or anything related to this? They talk to their DAM and then their DAM will be the one that often contacts us with specific issues or other problems they might be having, or if they just want advice on things, or runs the gamut. Those roles are internal people. Then of course there is externals, which I think falls more under your clients.

5. Please tell us about your interactions with other IT professionals?

There's five people in my immediate team or my peers, and we all basically work on the same thing. There's a bunch of teams like mine that take on the different areas of Xbox. So, you add audio, graphics, ours is networking, systems and CPU and things like that. Of course, you have the whole platform side of things where the people actually write the OS. They write the special Xbox layers on top of things and we interact with them quite often.

6. What about your interactions with clients or investors?

Most of the work I do is direct with clients. Either through a forum, through email, through teams and up to on-site visits. The DAMs will set up what we call an engagement. If there's a real problem and we need to set aside time. If It's going to take more than a day or so to look at this. They'll set up what's called an engagement, and then, depending on the level of that and then other factors like, where are they located physically? Are there travel restrictions? Things like that. If there's a developer that's just down the street (there are some that are like that), we will just go there because it's easier. Other times, we can do things over the phone and over email. That actually works out fairly well. It's nice because it

has a paper trail so we can go back and reference this stuff again. So anytime we go, and we solve problems and we figure something out, we have this big knowledge base (It's really a OneNote). We store all this information and so we can go back and search for it again.

7. What aspects of your work do you spend the most time on? Please tell us about these?

That is almost like a sine wave, right? We will go from where we are doing nothing but working with customers and right now is one of those times. We have the new launch of the console coming up in a month. We have a ton of titles that are all trying to certify, they're trying to get their stuff updated to the new platform. There's a lot of people all working in with new things all at the same time, so we're quite busy answering questions and helping people figure out how things are supposed to work these days.

Then on the other side of that, you'll have these big lulls where people have become familiar with the platforms and the systems. They don't have as many issues anymore and there's just not a lot of work going on. It is somewhat cyclical as to when software or games are released. During those times we get to work on what we think of is more forward-looking items. So, we will have incubation projects for new tools, new ideas, new services, as well as being able to do work where we're building up new samples. New middleware projects etc. One thing that we don't offer a lot of is middleware. By that I mean things like the Unity and Unreal engines. A lot of developers go to those because it it's pre-canned and has a lot of stuff. So, we work with Epic and Unity to have Xbox platform support built in for everybody and sometimes we will do things like that. In fact, just recently one of my colleagues and I finished adding a new platform piece that's called play fat party on Xbox. It is a pre-canned voice and networking solution and now that's something that you can choose to use. If you use Unreal, you can say "I want to use that piece." You check the box and basically it just automatically starts using it because it's built into their engine. We do some of that work too and that's a lot of fun, right? That's when you're spending more time coding than troubleshooting. Other times it's more troubleshooting than coding . It's actually one of the things I like. It comes up later. I think a lot of us would like to spend more time coding than dealing with some of the clients.

7.1 Adam: "I think a lot of us would like to spend more time coding."

Yeah, it's really hard. I've worked in a lot of different types of groups around Microsoft and no matter what, there is never a job where you're just spending all your time writing code. There is just too many other things that have to be done as part of the process of shipping software that you can't get away from.

8. Which aspects of your work do you find most challenging?

What I find personally often most challenging is trying to understand each different developer's actual needs. A lot of times they'll come and say "I'm trying to do this and it's not working right. Can you tell me what the problem is?" and well, yes, I could tell you specifically why that isn't working, but this seems like it's a symptom of a larger issue, right? You may be doing something at a more meta level. That's incorrect as far as the pattern that you should follow. We really need to spend the time, or understand what the goal is, what are they trying to achieve and what limitations they have so that we can then find the right way to solve that problem for them or to help them solve the problem. Then of course sometimes things work out really well but being a global product is challenging just with the translations. Some things like when I work with a Japanese developer. We have an intermediary that translates back and forth for us. So we type a response, they'll go in and translate it. The other person will then type their response. That will get translated back and it's kind of interesting, but you can lose a lot easily. It does make it take longer, and sometimes it just doesn't come out in translation exactly. You do lose what it is. I had one, I thought I saw that they were asking for, but then they came back and asked, "It came back a slightly different way?" I guess they meant this other thing and so that can be a challenge.

Secondly, with the complexity of all the systems and how they have to work together. You wouldn't believe how many things are involved. From when you when you sit on your Xbox sending an invite to one of your friends to play a game and for them to receive it and join and be able to play. There are many steps and different systems that all the things flow through. Sometimes it is really hard to find a root cause. You'll say, "Oh, I have this problem." It's showing up. Because of this, the user won't sign in correctly, but it's not actually a sign-in problem, but it actually turns out that that user is part of this title group that has these special properties set that only works in this other situation. It can take 5 to 10 people sometimes on an email thread just to figure out what's supposed to happen, what is happening and how we can fix it. And to be fair a lot of times fixing it means telling the title developer that they were doing something wrong, so it's not always our fault, but I usually take that angle first that I take the assumption that it's something that our stuff is doing wrong and then let people discover that it's not necessarily the case.

8.1 Adam: I think the end users will just blame you guys anyway, wouldn't they?

Yeah sometimes it's really hard to read Twitter comments because the lack of actual understanding. It can be frustrating when you read some of the things they say.

9. Can you share an example of the work you do that best captures the essence of the IT industry?

When I thought about it, I came up with the definition that it's basically utilizing technology to accomplish tasks or to get work done. If I go by that, I would say that when we were developing our samples. Samples do range from like one code file that just does something really simple to a full game. We have a full game that is an example/ sample for a bunch of

different things. It's is a lot of fun to work on. By doing that and having those samples out there, when we developed them, we developed so that they would pass our own certifications and that they follow all our own best practices so that it's a working example of the right way to do things. The nice thing about doing that is that a lot of developers will just take that code directly and they'll make it fit in their engine so we know when they're taking code that we've developed and tested and we know will pass certification and they're just using it. It's kind of win-win. I think that's actually one of those synergistic things where you gain more out of the end results, with the effort that was put into it initially. One of my favourite go-to is (when a client says) "I'm trying to use chat and my chat doesn't work in this situation well." I respond, "Can you load the sample and see if the sample has the same problem?" If the samples have the same problem, then we're probably looking at something had changed or broken the platform and we can investigate that way if it works in the sample then we can narrow it down to something in the way you're calling the code. So yes it does help a lot.

10. Daniel: Do you work from home at all and if so, do you prefer it to working in the office? Or if not, would you like to work from home at least some days?

Yes, so current situations aside, I had been working about 50-50 between home and office. I found that to be a really good balance for me because I do enjoy the comfort and convenience of being at home. I can just get up and I have everything around me. It's simple, but there's times when I'm working with people directly, or we're trying to troubleshoot issues, or I need more equipment than I have. At work, I have a stack of Xbox Dev kits that can utilized in many different ways. To do things at home. I only have two (Dev kits) and I can't do as many things and it's more difficult and more time consuming to do certain things. I do like to work from home, and when the office opens backup. I'll stick to our 50-50 style.

11. Adam: What aspect of your work do you find most enjoyable and why?

The things I enjoy the most is when I provide a solution or an answer to somebody and they come back with "Oh thank you this works. I've been working this forever and I could beat my head over and you solve my problem. Thank you so much!" When I help people solve problems, that's just that's my favourite thing. That's what I enjoy and end up getting the most enjoyment out of. There's personal satisfaction with doing your own projects, and these things like that, but when somebody physically tells you "You solved my problem and helped me!" I really like that. I also really enjoy the fact that my job is so eclectic at times. I'm not in the same rut of doing the same things. Each task, each problem is a new challenge. So it's it keeps it interesting.

12. Maddie: What advice would you give to someone who is just beginning to study or work in the IT industry?

It goes a long way for me is to find areas that you're really interested in and then saturate yourself with that. Really, the biggest thing you can do to help yourself is to do it hands on. If you think that you know configuring and running server farms is going to be fun, go out to Azure or someplace where you can get free virtual machine space for tinkering and do it. Do it over and over again. Try different things, break it because you will break it. Figure out what you did wrong. Basically. Now give yourself a sandbox to play in because that immersion is what, at least for me. Makes everything else come together more easily.

13. Channon: Do you find it hard keeping skills/learnings up to date?

That's a yes or no for me since we as Xbox, Microsoft will provide new services and new technologies all the time. It's just kind of part of my job to learn and know what is being developed and we're supporting them and helping other people figure out how we use them. I don't have a lot of time to invest in skills outside of my job right now. So, if I decided I wanted to learn something that's unrelated to my job, I would really have to spend most of my private time to do it. If it's something you really love then great, but it's harder to invest in something that you don't know will pay off when it's taking up that much of your time in my situation. It can be hard, but it if you put yourself in the right position, it can just come along with the territory.

13.1 Maddie: Do you find that's a result of the new release date coming up and Covid, or is that always the way it's been with your job over the past seven years?

More so lately, obviously. The way I do things, like when I find something that I'm interested in and I want to do it, I'm just going to do it right now. That's how I choose to spend my free time. If that happens to be learning new technology, then that works out. A lot of times though, I tend to want to go back and do things that I would find more relaxing I guess, so doing more retro things, going back and playing on the old Apple the TRS 80, old game console programming. You know something simplistic. It doesn't have to go anywhere. It may or may not help you in the in what you're currently doing, but it does still help you. You keep using your skills fresh. I guess the more you do different things, the easier it is to switch between things.

14. Jorge: What do you think are the most important skills and attributes for a job like this?

My job specifically, we're looking at having strong troubleshooting skills and good knowledge of relevant technologies. Most games are written in C++. If you don't know C++ very well, you'll probably have a hard time understanding certain things because you're not familiar with what side effects are there or how memory is treated. Equally, if you're not familiar with rest. APIs over the web you could easily make a lot of mistakes. So basically, the dedication to be ableto complete tasks. That's one of the hardest things I find between myself and a lot of my programmer friends is we all have a million side projects that never get done. If you can actually sit down and make yourself go through the process of doing

everything to completeness, that just makes it makes it easier because you've practiced it and your life will be better anyway, because you won't have things coming back to haunt you as much.

Patience is another good one. Sometimes it's really hard. One of my colleagues was having this issue today where he just couldn't get a problem that somebody reported to reproduce even with their own code. And he's like "I just don't know what to do anymore. I'm stuck!" Like, Well, let's just keep going through it and you just kind of keep trucking and eventually things pop up or you figure something out. You can't put it aside or give up. Obviously can't do that too much when you're getting paid for it. Patience just helps overall.

15. Sam: What new skills do you think will be in demand in the industry in 5 years?

The big future investments these days are around artificial intelligence, machine learning and big data processing. In games, especially machine learning, not just for gameplay, but systems that are used to make games. A game is really about moving and manipulating large chunks of data over and over and over again. If you can have a computer that can use a machine learning type thing that can look and evaluate. It can say "I seem to be loading these chunks from this specific place on this interval, in this mode. So, I'm going to self-optimize this and pre-fetch things that I think are going to comeup." By simply doing that you've all of a sudden increased your load times for your game and for other things. A.I would be more along the lines of if you are having smarter systems such as player interaction systems. When you're developing the game, you know there's a certain way to go about doing things and you try to optimize for what you think it's going to be. The most common scenarios, but you don't really know what those are going to be, and even if you do find the most common scenarios, what if it's only 60% of your users and the other 40% are having a less than perfect experience using something like ML The software itself could make the determination and dynamically pick the best optimizations for you, instead of having to statically choose ones that you hope are the right ones ahead of time.

IT TECHNOLOGIES

Autonomous Vehicles

By Madeleine Dupree (s3879009)

What do autonomous vehicles do?

Autonomous vehicles are self-driving or computer-driven forms of transport - usually cars- that do not require the full control of a human or none at all to operate safely on the road. In 2016 the Society of Automotive Engineers (SAE) created a standard for Levels of Driving Automation J3016 (SAE International that include levels 0 through to 5. Here is their original description of these levels:

SAE level	Name	Narrative Definition	Execution of Steering and Acceleration/ Deceleration	Monitoring of Driving Environment	Fallback Performance of Dynamic Driving Task	System Capability (Driving Modes)
Human driver monitors the driving environment						
0	No Automation	the full-time performance by the *human driver* of all aspects of the *dynamic driving task*, even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a
1	Driver Assistance	the *driving mode*-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	Human driver and system	Human driver	Human driver	Some driving modes
2	Partial Automation	the *driving mode*-specific execution by one or more driver assistance systems of both steering and acceleration/ deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	**System**	Human driver	Human driver	Some driving modes
Automated driving system ("system") monitors the driving environment						
3	Conditional Automation	the *driving mode*-specific performance by an *automated driving system* of all aspects of the dynamic driving task with the expectation that the *human driver* will respond appropriately to a *request to intervene*	System	**System**	Human driver	Some driving modes
4	High Automation	the *driving mode*-specific performance by an automated driving system of all aspects of the *dynamic driving task*, even if a *human driver* does not respond appropriately to a *request to intervene*	System	System	**System**	Some driving modes
5	Full Automation	the full-time performance by an *automated driving system* of all aspects of the *dynamic driving task* under all roadway and environmental conditions that can be managed by a *human driver*	System	System	System	**All driving modes**

Figure 1: Levels of Autonomous Driving by SAE International, n.d., graph.

What's the state of this technology?

Driverless cars are capable of using a wide range of technologies in order to function safely in a constantly changing traffic environment. Here is some of the most up to date technology:

- High resolution cameras are placed on every side of the care and are used to get a 360-degree view of the surroundings. These cameras vary in their field of view, some being wide and having a short range, others being narrow with a longer range. Cameras create a great 2D picture of what is around the car but cannot provide depth of vision for the computer to understand. Additionally, cameras are quite limited in their effectiveness in dark, dusty, foggy, snowy or rainy environments. High resolution cameras must be used alongside other technologies in order to give cars autonomous functions.
- Radar is the use of radio waves to detect the location and speed of other objects - usually cars. This is done by sending out pulses of radio waves that bounce back off of objects. The returning radio waves are then sensed by the car and provide information on the proximity of surrounding objects. Radar can also be used by boats, ships, aircrafts and meteorologist to detect weather changes.
- Light detection and ranging (LiDAR) is the use of lasers to create a 3D image of the earth or objects. These lasers are fast and invisible and function similarly to radar. However, LiDAR detects much more information so provides more opportunity for car autonomy.
- Thermal cameras are used to detect living things such as people and animals in a traffic environment. This can aid greatly in developing safety measures for driverless cars because the safety of humans should be the number on priority.
- Ultrasound is similar to radar in that it sends out signals to measure how quickly they bounce back to get an idea of how far away objects are. This can be very accurate at short distances in clear environments. For this reason, ultrasound is often used in cars to aid with self-parking.
- Global navigation satellite systems (GNSS) or global positioning systems (GPS) are used to approximate where the car is on the globe. This can be accurate up to a few meters or more. While this is not a new technology, it is still used by the autonomous vehicles made today.
- Inertial measurement units (IMUs) are used to identify the position and movements of the car, where it has been and where it is now.

What can be done now?

The most well-known and advanced technology in this area seems to be Waymo One. Waymo One is Google's sister company that launched its first commercial autonomous taxi service within the metro Phoenix area in December 2018. The service was first provided to just a few select customers who were a part of the Early Rider Program. These cars were always accompanied by a driver at the time but now that the Waymo One service is

available to the rest of the public in the metro Phoenix area, some of the autonomous cars are completely driverless. The Early Rider Program is still in progress in order to provide early feature access and to collect valuable research on these features. Waymo One is considered to be at level 4 in driving automation as it is still restricted to the Phoenix area and still require drivers some/most of the time for safety but essentially do all of the driving themselves.

As far as autonomous cars that are available to the public, Tesla is probably leading the way. They already provide cars that are well and truly classified as level 2, some have level 3 functions and in some cases level 4 driving on highways and more. However, these cars are said to be capable of level 5 autonomy after some software updates.

'I remain confident that we will have the basic functionality for level 5 autonomy complete this year' (Elon Musk talks Autopilot and Level 5 Autonomy at China AI conference, Teslacn 2020).

With Waymo One already having level 5 autonomous cars and Tesla stating that they plan to reach level 5 autonomy this year, it seems that autonomous cars could become quite popular within the next three years or even as soon as next year. The prices of the currently available Teslas in Australia range from around $79,556 for the cheapest Model 3 or up to $187,373 for the dearest Model X. However, the upcoming Cybertruck that will release in 2021 will be available for as low as $39,900 (Tesla 2020). It is noted that while this is Tesla's Australian website, there is no clear statement on whether these are US prices or AU prices, while the specs on these vehicles are indeed in US values - not AU - and other searches on these cars, external to Tesla, suggest that these prices may be in USD. Either way, the prices of these vehicles seem quite reasonable and possibly quite accessible to the middle-class citizen here in Australia.

While the service is on pause at the moment, there is a driverless bus service that runs the Geraldton Foreshore in Western Australia that offers a 30-minute drive next to the beach. It is called the Intellibus and it is completely driverless, though does still have two people on board who can take over the driving if necessary (RAC 2020)

What is the likely impact?

There are and always have been many safety concerns related to autonomous vehicles or any technology that has control over human lives. Placing our lives in the hands of robots that do not possess morals to guide them is unnerving to say the least. There are many questions that may need to be answered before the general public can feel comfortable around these machines. For example, are pedestrians always safe around these cars? Will level 5 cars be able to ensure the safety of the people inside? Are these cars more or less

safe than human-driven cars? There may also be moral questions such as, can the car's choices (e.g. parking preference or speed) be altered to suit the owner or passengers? Should they be altered? Who is at fault when these cars make mistakes, the driver or the manufacturer?

Another thing to consider is security. Autonomous cars are run by a computer or several computers which leads to the possibility of hacking concerns. While the manufacturers will most likely have considered this thoroughly, can they guarantee that their systems will not be compromised? Autonomous cars that use satellite or GPS may raise concerns about location security. Both physical safety and cyber safety will need to be considered when developing or purchasing autonomous cars.

These cars would surely function better if the roads were catered to autonomous cars, rather than human-driven cars. If driverless cars become popular there could be major changes in how roads are initially made or updated. If the road communicates with the car rather than just the car detecting the road then this could lead to more efficiency and better safety precautions. Our roads could look very different if autonomous driving becomes mainstream.

Tesla is well known for their electric cars which could lead to more sustainable options such as solar power. If driverless cars are run on electricity rather than petrol, that could be a big step in the direction of reducing the currently negative impact that cars have on the earth.

Which people will be most affected and how?

Many people could be affected by the rise of autonomous vehicles because so many people use cars. Anyone who drives a car or who walks the streets could experience a neutral/positive benefit due to the number of car accidents that may be prevented by driverless vehicles. Anyone who drives an autonomous vehicle for work may end up saving time or money in the long run. Those who make autonomous vehicles could make quite the profit on these amazing new cars. Anyone who takes public transport could benefit from busses or trains that are more likely to be on time due to calculations, rather than predictions. Could autonomous trains one day save lives due to rigorous safety features and reducing the number of people who die on train tracks?

I think autonomous cars could be most beneficial for people are blind, vision impaired, injured, elderly, disabled or otherwise unable to drive. Driverless cars could potentially provide these people more access to their communities, friends, family, appointments and other needs. By providing a reliable, safe and trustworthy system of transport, these people could have longer and more enriched lives.

Will this create, replace or make redundant any current jobs or technologies?

If driverless cars do become more popular, there is the potential for more jobs to be made and some jobs to be lost. For example, Uber drivers, taxi drivers, bus drivers, delivery services or even train and tram drivers could lose their jobs in the near/distant future due to the promised safety features that driverless cars have. These cars do not tire, do not make human mistakes, do not drink drive, do not get distracted by mobile phones and do not speed by default. They also are able to predict the most efficient route and overtake when it is useful to do so. This means that these cars have the potential to be safer, quicker and cheaper than human-driven cars in many settings.

Alternatively, more jobs could be made through the manufacturing, maintenance and research that is put into these cars. With our ever-changing roads, these cars may require ongoing updates to ensure that the computers know what their surroundings mean and how to respond safely. At this stage, software updates require human intelligence and intervention, therefore possibly more jobs. If these cars become mainstream then people will want to purchase new models with different features and different looks, this will require more people working towards these goals and selling these cars at new dealerships. This could also mean that our current popular cars become less mainstream, leading to lost jobs at other dealerships. It is hard to say how this may look in the future.

How will this affect you, your family or your friends?

I imagine that autonomous vehicles aren't going to impact my life much in the next three years as I am not planning on purchasing one in that time. I also do not currently have a job that requires that I drive anywhere so I probably will not be offered a driverless vehicle for work purposes. I do not take public transport very much so I am unlikely to use an autonomous bus. I prefer to drive myself and avoid the cost of delivery where I can so I would not likely utilise driverless taxis, Ubers or delivery services more than I do now. If autonomous cars become popular in my area then I may be safer on the road or as a pedestrian due to a potential ripple effect but other than that I imagine my driving experience will not change much at all in the next three years. If autonomous vehicles prove to be safer than human-driven vehicles then I will at least appreciate their growing presence in our society.

I don't know if any of my family members or friends wish to purchase an autonomous vehicle in the near future so I cannot predict if they will experience much of an impact from these new cars, much like myself.

My partner has expressed interest in the Cybertruck but has a fairly new car himself which he barely uses so he probably will not choose to purchase the Cybertruck at this stage. If he did though, I would be pretty curious to experience what it is like. I think it could be exciting

for any new buyer and their friends to see how it works, how smooth the driving is and how safe it would feel.

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Blockchain & Crypto-currencies

By Samuel Mennen (s3876937)

What does it do?

What is state of the art in this technology

Originally intended for decentralised, digital currencies. Blockchain technology was first released by either an individual, or a group using the name Satoshi Nakamoto. Nakamoto's white paper for Bitcoin (2008) discuss how blockchain can be developed as a secure network for making transactions, creating digital assets and proving validity based on cryptographic proof. In the case of Bitcoin, there is no centralised body responsible for the

blockchain. The blockchain relies on users contributing computing power to the network through nodes. To create incentive for individuals to contribute, these nodes each compete to solve a cryptographic hash, the first to solve the hash is awarded bitcoin which is then added into circulation. This is referred to as mining. The blockchain is often referred to as a ledger and contains every previous block and very single transaction. As of the 28th of September 2020, the Bitcoin blockchain is 301.724 gigabytes (blocks-size, 2020) with a new block being added roughly every 10 minutes.

What technological developments make is possible?

Blockchain can be considered a family of technologies used to maintain a digital leger. Babich and Hilary (2018), have discussed that since the 1960s, databases were typically centralised entities and often required complex integration procedures, complex security encryption protocols and consistently face risk of obsolescence. Blockchain is often viewed as a solution to these issues due to its end-to end encryption methods and commonly open source nature. Babich and Hilary further state that there is an over-optimism towards blockchain in regard to these issues and blockchains still suffer from bugs and security breaches.

Blockchains are generally open-source and participation from its users and is democratic, provided that 51% of users accept changes in the source code and allow them to be implemented. The computing power required is referred to as hashrate and is based on the cryptographic method of demonstrating proof-of-work. This has not prevented Bitcoin from facing the threat of a 51% attack in the past. Blockchain sceptic Gerard (2017 pg. 60) writes that in June and July 2014, mining pool GHash.io was able to exceed a 51% hashrate on multiple occasions. A rogue employee was reportedly able to use this opportunity to double-spend against gambling services (Ibid). Other blockchain projects such as Vechain have added centralised elements to combat this threat. In the Vechain white paper v2.0 (2020 pg. 17), it is stated that "A proper governance system, with transparency and operational efficiency, will enable continual and rapid innovation." To achieve this, Vechain utilises Authority Master Nodes which enable designated stakeholders to influence development through a voting system. Having centralised elements offers a solution to the security risks and helps more efficiently development and investment opportunities.

What can be done now?

As of now, blockchains have become much more than an alternative for fiat currency. Further innovations and applications are being developed constantly. Blockchains such as Ravencoin (Fenton and Black, 2018 pg. 2) utilise blockchain for the validation of assets. Likewise, Vechain (2020 pg. 1) focuses on business activities such as "Traceability, anti-counterfeiting, food safety, intellectual property management, product life-cycle management..." This demonstrates how blockchain can be utilised for product and supply-chain management.

What is likely to do be done soon (Next 3 years)?

Future application of blockchain in the medical field is also in development. Roman-Belmonte, De la Corte-Rodriguez and Rodriguez-Merchan's findings (2018) show that blockchain is being developed to manage authorisations, share patient data and validate patient identities between healthcare partners. Furthermore, they demonstrated how blockchain can enable a Patient Centred Electronic Healthcare system. With potential lower risk of fraud and falsification, patients can have agency and less restricted access to their own health record (Ibid).

What is likely impact?

What is the potential impact of this? What is likely to change?

Typically, setting up network databases has a high cost. Blockchain provides a solution to mitigate these upfront costs and is likely to be popular with start-ups. In the early stages, start-ups release a white paper for their blockchain which not only specify the technical process but also act as marketing material for potential investors and in the case of open source blockchains, encourages developers to contribute (Park, Shin and Choy, 2020). Babich and Hilary (2018) express criticism towards blockchain. As they grow, they become more inefficient and the cost of maintaining a network becomes considerably larger than centralised network systems. Zohair's findings (2020) indicate that bitcoin requires 332 megawatts of continuous energy consumption. As the blockchain gets larger, more resources are required to maintain it. This cost is brought upon those who decide to maintain a node. Future innovations to blockchain will most likely attempt to improve efficiency and compatibility with other systems.

Which people will be most affected and how?

Kshetri and Voas (2018a) discuss that blockchain can benefit developing countries where there is a lack of formal institutions to store data for essential services and enforce property rights. This can reduce corruption significantly as it is extremely difficult to alter or tamper blockchained legers as all transactions are recorded and accessible from every node. In March 2018, Sierra Leone held the first electoral vote using blockchain Ksertri and Voas (2018b). Votes were stored in an immutable leger. Voters were able to do so anonymously, minimising political prosecution and help legitimise election results in a turbulent political climate. This is an example of how blockchain can be used for counter-fraud measures and proving validity.

Will this create, replace current jobs or technologies?

Despite blockchain often being seen as solution to more traditional, centralised database systems. Due to blockchains inefficiencies, it is unlikely that blockchain will replace centralised systems entirely. Blockchain does however have potential to excel in

authorisation and validation scenarios. This can simplify bureaucratical purposes. In regard to replacing current jobs, blockchains automate many administrative tasks potentially effecting jobs. However, contributing through nodes can reward tokens and crypto currencies which could be considered a source of income.

How will this affect you?

In your daily life, how will this affect you?

In daily life, blockchain networks will have a transparent effect and the majority of people will not be aware of the difference between centralised networks and blockchain networks in most cases. Blockchain will play a larger part in validation and financial services. Payments and transactions are perpetually available via a digital leger that anyone can access and can automate bureaucratic services for situations such as tax declarations and proof of ownership.

What will be different for you?

If blockchains are widely accepted and implemented, many services we use daily will be different. How we receive medical care, prove identity and interact in financial matters could be potentially streamlined to a point where any service that requires any form of validation can be done in a matter of seconds without the need of a third party/ centralised body. The nature of blockchain minimises the possibility of fraudulent activity, reducing the risk of scams.

How might this effect members of your family and friends?

For friends and family, blockchains and cryptocurrencies allow peer-to-peer transactions and agreements. This reduces the need third party institutions, allowing faster transactions and sharing of data. Even though blockchains excel at validation, there are some concerns over privacy. Babich and Hilary (2018) express lack of privacy as one of the major disadvantages of blockchain. The nature of blockchains is that it is difficult to erase previously recorded data and creates a scenario where transactions can be accessed by anyone who has access to the blockchain. Services such as such Bitcoin Block Explorer (Bitcoin Block Explorer | BlockCypher, 2020) grant anyone the ability to check any block and any transaction in that block. In a time where your digital footprint defines you, users need to be aware of potential consequences of their actions and how they may affect them in the future.

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Clouds, Services & Servers

By Jorge Esteban (s3874914)

What does it do?

Cloud computing in a very simple way is the access management and storage of data from anywhere at any time: cloud computing helps to store files and access programs from remote locations, this data can be access using a smartphone connected to the internet or a computer. cloud computing is service use by many companies nowadays. the company or user pays a fee to have access to a wide variety of resources cloud computing offers. for example: a person can use the cloud to store and backup data, by transferring this data over the internet to and offsite cloud storage system it would make it accessible from any location at any time.

What's the state of this technology?

The state of cloud computing is very bright according to an article from "critical case.com" cloud computing in 2019 is expected to be around the 206,2 billion dollar industry. more and more companies have become aware that cloud computing provides the resources that companies required. Without the company to invest massive amounts of money in creating and maintain their own data network.

What can be done now?

Cloud computing can offer a wide amount of services for example infrastructure as a service (Iaas) , software as service (Saas).

As for a Iaas this is a service that cloud computing companies offer, which deliver virtualized computing resources to organizations via the internet. this is one of the main types of cloud services expected to have a reach of 40 billion in 2019. the second main type of cloud computing service is SaaS, this is a software distribution service in which the provider hosts the applications for customers and make them available to these customers over the internet , companies using this Saas don't have to worry to install or run applications into their own systems , everything is based on the cloud . This eliminates the costs of purchasing and maintaining hardware.

Platform as service (Paas) : this is service for developers that help develop or build applications. it provides all the tools and resources the developer needs to work in the project and also to work with others. Now with this service developers can access to their projects anywhere from a web browser because the development project is not hosted locally. This is a great tool because it also helps to collaborate with other people around the globe and work faster. In conclusion with IaaS, SaaS and Pass. Cloud computing is a robust and very capable system that is very capable to handle any task. and would improve productivity and save money.

What is likely to be done soon?

We can expect that more companies eventually would shut down their own data centers and turn to cloud computing giving the enormous amount of resources it provides and the

low cost it represent compared to maintain their own data center. as well we can expect cloud computing to be more integrated into our daily life. One aspect of cloud computing that is starting to grow so fast is in the video game sector. there is already a few companies that provide cloud gaming google with google stadia and Nvidia with GeForce now. These two offer users a pay subscription that would allow players to play their games on demand from their phones tablet or pc 's as long there are connected to the internet. by using the processing power of their data centers, they can stream the gaming content to the player to any location. This is likely to be the next step for cloud computing.

What is the likely impact?

There would be positive and negative impacts. On the positive side cloud computing has help companies to hire the computing infrastructure they need saving them money. These benefits include stable services and accessing to new software applications every time there are new updates. It would increase flexibility, the way how people work. now people can work remotely or just keep on track from what other people are doing. Collaboration with more people would be greatly expanded sharing or accessing information with a large group of people would increase productivity.

I believe that cloud computing would bring a lot of benefits to everyone that uses this technology, it would save time and make work more flexible and people can be more productive.

On the other hand. there would be negative impacts on how cloud computing would be storing vast amounts of consumer data information. Making it a perfect target for hackers who would try to disrupt the service or steal information. but is not only these factors that make cloud computing. A vulnerable technology, there is also down time like what happened back in 2017 when Amazon servers went down were the mistake of one company employee debugging and issue with the billing system accidentally took more servers offline then the error created a domino effect. That cost around 150 million dollars.

What is likely to change?

This technology would be evolving and be putting to use in other technologies to work, like for example machine learning. Other aspect is the reinforce of security and data privacy as more people and companies would be more watchful on how their information is being manage. Another change that we would see soon, would be the obsolescence of certain jobs and the creation of new ones. Once companies turn to cloud services some IT positions inside the company would be cut down, as all the services, software installation and network maintenance would be ceased to exist inside the company.

How will this affect you?

This effect is already happening in large number of people's around the world now services like google drive, droop box or Microsoft one drive come for free or pre-installed in mobile devices. So, people can get into the cloud services. Other platforms like Facebook or YouTube have a great influence in our daily life's. We have access to information in seconds and share information with other people around the globe. We have become more informed thanks to these technologies. There are many areas in were cloud computing would have and affect in our life's driverless cars, healthcare, education.

What would be different for most people with cloud computing?

Cloud computing is a service, provided by a company. It means that we the people are being moved into use these services. These services come on monthly fees or yearly fees. So, we would be attaching to a subscription scheme. No longer we would be the owners of the software but only users.

What this would be different for us people?

Cloud computing relies on the premise of much faster and always online access to our files. Which it means we are putting the trust into this companies to store and protect our sensitive information. Our data can be more exposed than ever before. For most people this would be a great tool to work in many different areas as we can now work or collaborate and share our information with more people than ever before, new projects or ideas would become much easier or faster to create. New jobs in the IT sector would be created and new IT innovations.

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Cybersecurity

By Channon Harper (s3871491)

What does it do?

What is the state of the art of this technology?

As stated by (Kaspersky, n.d) Cybersecurity is the implementations to defend computers, servers, mobile devices, electronic systems, networks, and data from malicious attacks. It has numerous categories and in practice is the security systems in place that protects any electronic device. Technology is growing in all forms and is a key to future development but with this brings new security challenges. With new programs and technology being introduced at an exponential rate the ways in which can be compromised is also continuing.

What can be done now?

In its current state we have access to numerous safeguards such as Data Loss Prevention, IDS, IPS, SIEM, Firewalls and Antivirus. Many of which have updates on weekly/daily bases to keep up with the ever-changing technology they are protecting. Along with these the two-factor authentication has been an important introduction to securing many accounts. You can think of Cyber security only by recognizing the many aspects that it holds.

What is likely to be able to be done soon? and What makes it possible?

According to some the future holds many more regulations introduced by local and state governments to help prevent the risk by standardizing the safeguards that need to be in place. In terms of technology Forbes states (chuck brooks, 2020) the introduction of AI is said to be the future, with the main focus on Machine Learning. It is stated that the technology will rely on rapid automation of predictive analytics, which in sense will be the fastest way to identify new cyber-attacks, draw statistical inferences, and push that information to endpoint security platforms. Amongst other key notes I believe the use of AI to integrate SOAR or security orchestration automation and response into a single interface which will allow security staff a faster more accurate way to process the large volumes of data to prevent or stop attacks that may be coming or are currently underway.

Apart from the introduction of AI there is also talks of Biometrics, The world economic forum (William Dixon, 2019) states that there is expert consensus that a three-factor authentication will be the best option 'Know' (password), 'have' (token) and 'are' (biometrics). With this also brings new threats of exploitation, with the use of fingerprints, eye scans, and voice as all these will need to be stored and the more information that is stored the more that can be stolen.

As stated previously there are many safeguards to help in the world of cybersecurity, Current technologies in more detail as listed by Educba (2020).

Data Loss Prevention

DLP is a set of tools and processes used to ensure that sensitive data is not lost. This Validates the data sent from organizations/persons not of a sensitive nature. It scans all outgoing data to ensure it is appropriate and something that is not confidential. Once a violation has been identified, DLP enforces correction with alerts, encryption, and other protective actions. The main reasons for using DLP is for Personal Information Protection/Compliance, IP Protection, Data Visibility.

Intrusion Detection System (IDS)

This technology is a form of software application or hardware appliance that monitors all incoming traffic to organizations/persons to ensure that it is not of a malicious context. The main purpose for IDS is to inform IT personnel that a network intrusion may be taking place, it is a passive technology as it only detects notable traffic after the fact and does not block or stop it. Amongst the IDS they also fall into subcategories such as VM-based IDS, stack-based IDS, signature-based IDS, perimeter IDS, and anomaly-based IDS.

Intrusion Prevention System (IPS)

This Technology is that which acts against traffic that is deemed malicious by the IDS. It usually drops the packets of information incoming so they cannot enter the organizations system. The main difference between the IDS and this the IPS is a IPS can access the IT

network and protect it from attacks/abuse. It monitors intrusion data and prevents an attack from developing by doing things such as closing access points, configuring firewalls.

Security Incident and Event Management (SIEM)

This technology is used as a reporting and an alarm system, Other tools integrate with this technology to ensure that whenever a breach has been detected it is known to a security team. The main goals of SIEM is to provide reports on security-related incidents and events, and send alerts if analysis shows a potential security issue.

Firewall

The firewall is the first layer of protection on any system or network, it comes in many types depending on the role that is required of it. It makes sure that the internal network is protected from unusual/malicious traffic cannot enter. A firewall can be hardware, software or both. There are also many types of firewalls such as Proxy firewall, Stateful inspection firewall UTM firewall, Next-generation firewall (NGFW), and threat-focused NGFW, there is also the great Firewall of China.

Antivirus

As name states it indicates a virus and removes it based on a repository of signatures present in the coding. Needs to be kept up to date to keep all signatures on record to detect the newest of threats. What it does is to Scan specific files or directories, Allows you to schedule scans automatically, Allows you to initiate a scan of a particular file or whole data, removes any malicious code detected (or asks to clean file if possible), and shows some statistics on computer health.

What is the likely impact?

What is the potential impact of this Technology?

The impact of this development is huge as it has already been seen with the implementation of varying technologies. If it does not keep up with technology being made you could see some science fiction coming to life and even in the smallest sense identifications that can no longer be confirmed.

What is likely to change?

The things most likely to change is further encryption and making items more secure. As we have seen with development over its time the technology has increased and so has the need to secure them. As it is the blueprints that can enable the good and remove the bad from innovation development it will always be the top priority for anything technologically based.

Which people will be most affected?

Anyone that uses any technology that shares data will be affected by the use of cybersecurity. According to Cybersecurity Ventures (2019) (Steve Morgan, 2019) - it is predicted that the number of humans on the internet will triple from 2015 to 2022 and reach 6 billion, and by 2030 will increase to 7.5 billion. Another key statistic is that hackers attack every 39 secs, on average 2,244 times a day (University of Maryland). So, with the increase in use of the internet and data being stored there will be an increase in people trying to access this data therefore the need for cyber security will also have to increase.

Will this create, replace, or make redundant any jobs/tech?

According to the Bureau of Labour Statistics the rate of growth for jobs in IT security is projected at 37% and according to Institute of data Australia is currently short of 2300 workers in cyber security, with an expected demand of at least 17,600 additional professionals in the sector by 2026. So, the furthering of cybersecurity will create more jobs in the coming years new ways of protection of data may be discovered and some technologies may become redundant.

How will it affect you?

How will this affect you?

This will affect me in numerous ways as It will with a lot of others. With the Digital age and the way, a lot of companies are going with online bookings and recorded data we hope that what we input is secure. If cyber security fails to keep up with demand many will lose identities, money and possibly their minds. On a personal note the increase in need is a good outcome as I wish to get into the field of cybersecurity. On the downside to it all unless there are miraculous improvements nothing will ever be 100% secure so the chances that something bad will occur will always be a likelihood.

What will be different for you?

The difference it has made for me is that I am always cautious as to what information I have inputted or sent out. It has come to the state that I have made a fake profile and email for those systems that I do not find a necessity however ask for certain information.

How might this affect members of your family or your friends?

This will affect my friends and family the most as without the study applied to the field they will be at higher risk. I hope a lot of what comes makes it more secure so the use of the internet will not be so much of a risk. I can see as further development of technology occurs the less people may know about it in their later years and if they have no personal interest in IT at all they may not know what puts them at risk. The development of cyber

security is just as important to a big company as it is to anyone. The learning curve for how everything is moving even in its current state has been neglected to be taught to the elder generation, so the reliance of programs to automate your security will be the defining factor of how the future turns out.

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OUR PROJECT

Written By:

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Overview

Our teams project idea is a mobile application, this application will scan the user's privacy and security settings on Facebook and other social media platforms to allow the user to be more secure and private. The application will work by the user giving us permission to access their social media accounts, once this access has been granted our server side application will analyse the users social media accounts when directed by the user, once the analysis has been completed the mobile application using push requests will notify the user if their account or accounts are in our opinion not secure or as private as they should be. As social media platforms attempt to minimize how much external applications can access or change via their API's our application will need to use a combination of API calls and web scraping of the user's profile to accomplish this task.

For example checking a user's Facebook account using a combination of web scraping and API calls, our application should be able to determine if a user has posts set to public, pictures publicly available besides the required profile and cover photo, has personally identifiable information shared to the public such as employment details, email address, phone numbers, etc., determine what applications have access to their social media accounts which may pose a security or privacy risk and check for chainmail posts.

Users will then be given access to tutorial videos which will be hosted on our own webserver, which will guide them step by step to correct the security and/or privacy concerns our application has found, these concerns will also be explained to the user in simple terms that the non-technical person can understand.

Additionally, the application will also notify the user of privacy agreement and terms of service changes with their social media accounts registered with our application and supplying the user with more insight on how these changes may affect them or others.

Initially the application will be written to target the privacy and security settings of a user's Facebook accounts, with the long-term goal of also supporting Twitter, Instagram, WeChat, and others in the future.

Motivation

The motivation for this application was to empower users of social media to take back control of their online presence and educate them on the security and privacy issues associated with their use of social media.

Humans are social creatures, and the digital era did not change this, but it did vastly change the way we communicate. Using social media, we have instant access to billions of people, and we have new ways of interaction. But social media has privacy and security risks, when not used appropriately. It is used also by criminals for fraud, gathering business intelligence, stealing sensitive information, etc. (Tayouri 2015).

The rise of the social web has traditionally been accompanied by privacy concerns (Netter, Herbst & Pernul 2011). Many people may not be aware of how much personally identifiable information about themselves they are sharing online to the public and how secure their various social media accounts are, or how vulnerable they truly are. How a person has their social media accounts security and privacy settings setup makes a substantial difference in determining how much information about them is available to anyone online and how secure their account is in terms of being vulnerable to hacking or other interference or breaches.

Because we are passionate about privacy and security awareness, we wanted to put users back in control of their social media/digital presence and minimize personal data exposure. We believe this application will be useful in achieving that aim.

Description

Application

The project is an application for Android and iOS smartphones that will also require external servers for computational purposes. It will check the security and privacy settings of the user's social media accounts, highlight concerns, and make recommendations to improve the safety of their data and personal information. The user will be given links to tutorials demonstrating how to make changes to their settings and navigate the labyrinth of menus purposely designed in a manor to ensure users share as much data as possible by default to allow the company to achieve maximum monetisation. Notifications will be used as the method of keeping users up to date in changes of company policies that affect security and privacy, so they will continue to be protected over time.

Social Media

The Social Media platform the application will initially support, will be Facebook, with our intended design, we will be able to incorporate more platforms in the future such as Twitter, Snapchat, LinkedIn, Pinterest, and Reddit among many others.

To authenticate these social media accounts, we will be using each platforms API verification methods to conform to their standards for approval.

The security tokens generated by these APIs will then be encrypted and stored on their device by our application and only be decrypted and supplied to our external applications when requested by the user, once the external applications have completed the tasks they will automatically destroy the copy of the token.

If the user were to delete our application these tokens will be deleted by the mobile application after the mobile application revokes its access to their social media platform accounts, ending our access to their social media platform and personal information.

Security, Privacy and Sharing Settings

Using a combination of web scraping and Facebook API calls we will be reviewing the user's entire profile from zero day (Account Creation Day), and checking the privacy settings on every post, image, video and flagging chain/spam posts they have shared. And suggesting changes and deletions.

We will also be checking the privacy settings set on individual profile information such as Work and Education, Places Lived, Contact and Basic Information, Family and Relationships, Details about you and life events.

NOTE: These checks will require the users consent each time, As these checks will not be automatic unless the user schedules these checks, scheduled checks will require the users phone to be online with our application running in the background to allow the API tokens to be decrypted and exchanged with our servers otherwise the task will fail.

Additionally, we will use non-invasive reminders for the user not to use the same password on multiple platforms.

Notifications

The application will deliver notifications to the user from our external applications or bulk notifications we have scheduled or if we flag a social media platform as having changed their privacy agreements, terms of service, or other related documents, and data breaches.

Occasionally we will also remind the user to run a privacy check-up if they have not run one in more than 60 days.

Tutorial Videos

Tutorial Videos will be web encoded and streamed using a simple html5 video player.

Each tutorial video will need to be recorded, for both mobile and desktop versions of the website, with closed captions added, long term these will need to be translated closed captions to support additional languages.

Tutorial videos will be predominately screen captures with voice overs.

Innovation

Possible upgrades in the future to the application would be to leverage the power of AI and machine learning to accomplish the web scraping of the social media platforms, allowing the backend applications to adapt easier to layout changes imposed by the individual platforms, this will also vastly reduce development time on a per platform basis.

Limited analytics which are limited in the capacity they can store no personally identifiable information, can be introduced to both the mobile application and backend applications to assist in identifying where users are consistently having issues, for example we would be able to know if users are finding particular tutorial videos difficult to follow and giving up, this information would assist us in creating better tutorials. We would also be able to identify what the most common security and privacy issues are on various platforms and publish this information.

With the use of limited analytics and machine learning the effectiveness of our application will hopefully grow at an exponential rate with the user basis and becoming more effective over time.

Tools and Technology

Our project will be requiring several technologies, tools, and resources to accomplish our project goal. These will be hosted virtual servers, devices for testing our application, software packages, software development kits, and application programming interface documentation.

Virtual Servers

Virtual servers will be used for the backend applications that will be processing the user's Security, Privacy and Sharing Settings using a combination of API calls and web scraping that will be too complex for a mobile device to accomplish with any real speed.

Some of these will be used as webservers to host various tutorial videos and support pages, we have chosen to use NGINX as our webserver software due to its ability to serve larger visitor numbers than Apache2.

A combination of PostgreSQL and MongoDB database servers will be used by both webpage content and backend application data storage.

AWS will also be used for end point delivery to the mobile application and for inbound feeds from the social media platforms to avoid security protection systems in place that may block our access as suspicious activity due to the high volume of traffic.

Devices & Testing Platforms

To adequately test our application, we will need access to both a compatible Android device and a compatible Apple device. However, in the early stages of development we can use the development environment SDKs virtual machines to test the basic functionality and review the design of the application.

Development Environment

Android Application - Android Studio will be used to build the mobile application for android devices using the publicly available Android SDK, this software is available on Windows, Mac, Linux, and Chrome OS.
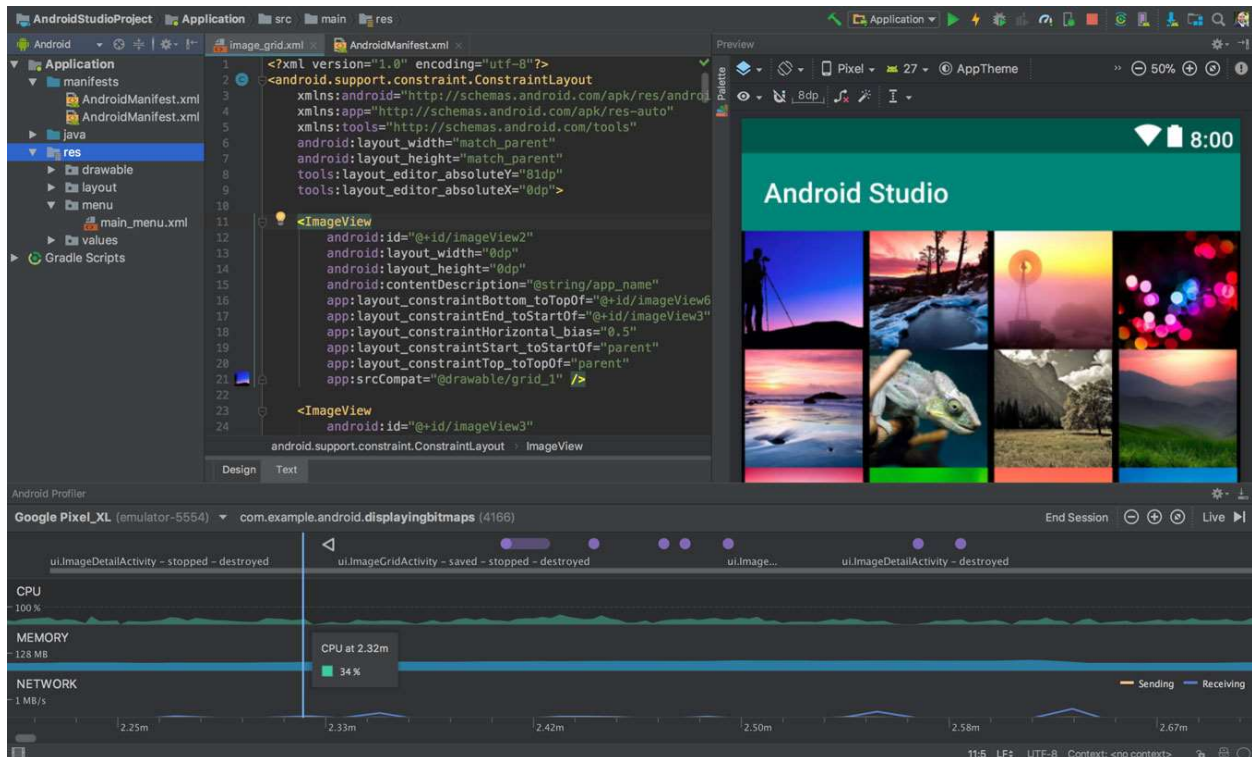

Figure 1: Andriod Studio UI, Source: https://developer.android.com/studio

iOS Application – Apple XCode and iOS SDK will be required to build an iOS application, unfortunately this is only available on Mac, to get around the hassle of requiring an apple computer we will build a virtual machine running MacOS. This is called a Hackintosh.
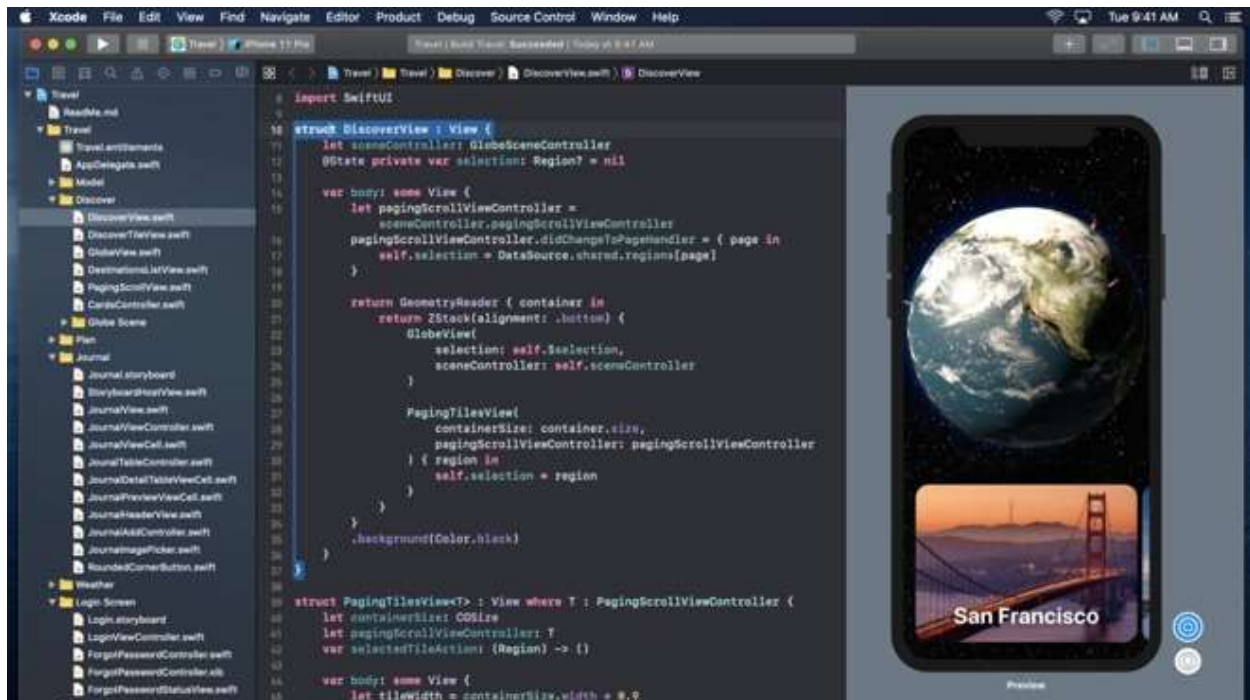
Figure 2: Apple XCode UI, Source: https://appleinsider.com

Facebook Platform – to access all the features of the Facebook API and SDK we will need a Facebook developer account which is subject to approval and has a complicated and lengthy process.

Code Repository – All code will be checked into private repository's on GitHub, they will be private to prevent public access to our source code which may benefit a competitor, hackers, or make it easier for social media platforms to prevent us running our various checks.

Backend Development – a combination of PHP, JAVA and Python will be used to create the various Security, Privacy and Sharing Setting checks, as parts of these checks will be easier to accomplish using different programming languages and will allow us to use a lot of prebuilt software tools.

Tutorial Video Environment

Open Broadcast Studio, will be used to record our tutorial videos as it allows us to screen capture, and record audio, Adobe Premiere will then be used to edit the footage and insert various extra footage that may be required in the tutorial.

Skills Required

The skills we have identified that will be required for this project are:

- Programming Languages: PHP, Python, JAVA
- Knowledge of Android Studio and Apple XCode
- Ability to learn and work within SDK's
- Understanding of API's
- Understanding of SQL
- Understanding of PostgreSQL and MongoDB
- Linux Administration / Management
- Video Editing
- User Interface Design
- Photo Editing

Outcome

If our project is successful, the users of our application will have their social media security and privacy settings aligned with their own personal preference and be only sharing what information they deem fit to the appropriate audiences.

Users will be confident that their use of social media is as safe and secure as their social media provider allows and be aware their accounts are as safe as possible from interference and their data and personal information is secure and protected. Hopefully, users will be educated in the risks associated with social media use and the appropriate settings and measures to take place to mitigate those risks, allowing them to enjoy the benefits of social media and avoid the numerous pitfalls.

With our application monitoring for changes that social media platforms may make to any security or privacy policies or practices, users will also be protected into the future and have no need to be anxious about any adverse changes going unnoticed.

The original problem of poor social media security and privacy will be solved, and user's awareness and education will be improved.

The potential drawbacks are the need to have the application running in the background to allow it to provide notifications about setting changes and possibly the need for the application to be updated periodically.

As the application may not be able to make all the changes to a user's social media account or accounts itself due to the limitations imposed by the social media platforms to their APIs

and will have to rely on the user successfully following tutorials, human error may mean some changes may not actually take affect but the user will think they have, lulling them into a false sense of security, however in this case the application will notify the user again, the user may give up making the changes if the task is too laborious or complicated which it sometimes can be when navigating social media security settings - they aren't always the easiest to locate.

Another potential obstacle we anticipate is keeping up with the changes in a timely manner and having new tutorial videos ready. The tutorial videos must also be easy to follow and aimed at novices which will need testing - the videos could seem easy to follow to ourselves who have IT experience, but we may leave some people behind. We will keep this in mind during development to make sure the app is effective. With appropriate measures and safeguards we believe this application has the potential to make a real difference in improving social media security and privacy, so it can be used safely, and be the enjoyable experience it set out to be, without the risk.

References

Netter, M, Herbst, S & Pernul, G 'Analyzing Privacy in Social Networks – An Interdisciplinary Approach', 9-11 Oct. 2011, pp. 1327-1334.

Tayouri, D 2015, 'The Human Factor in the Social Media Security – Combining Education and Technology to Reduce Social Engineering Risks and Damages', Procedia Manufacturing, vol. 3, pp. 1096-1100.

GROUP REFLECTION

As a Group

What went well?

As a group, we all agree that from the start we were all eager and ready to go. The initial group forming was done quickly and once the introductions were done and the communication started. Being lucky in the selection of our members from an open invitation we ended up having people from all backgrounds with varying skill sets.

Tasks were broken down to skill sets that suited each person the best we could, which gave us a quick start with the content being completed at an early stage for everyone to read over and collaborate on. All of us got along like we have had known each other for years and the support each of had given each other was beyond what any of us initially expected. We are all proud of what was achieved and could not be any happier with being part of The Fighting Mongooses.

What could be improved?

This was a hard one for all of us to decide on as we all agree that overall, the commitment of the group and what was achieved was phenomenal. There were only minor issues in hindsight mainly the commencement of daylight savings and with the scheduling of meetings within them. However, it only affected the scheduling of one meeting.

With the use of teams and our out of band communication, there was usually always one group member available, however sometimes specific team members that needed to collaborate on a task were not online at the same time, so the reply process was slower, this was also only a minor issue.

At least one thing that was surprising?

Surprising to all, was just how well it went with the willingness of everyone to contribute. The support we gave each other even with items outside the scope of the assignment, such as sharing knowledge and experiences. This sharing helped us grow as a team.

At least one thing that you have learned about groups?

What we all took away from this varies between each team member. However, we all agree that a positive work environment and good team morale is the key to success. Seeing the hard work each team member would put into a task, made us all want to work harder to achieve the same level of dedication. There is no I in team and when all the cogs are working together, the weight is lighter and easier to move.

Adam's Group Reflection

What went well?

In the beginning I was curious on how events would unfold. Initially the group was quiet as we grouped up when first instructed to do so by Tim. But as the group assignment start date was nearing the group sprung to life and has been at full swing ever since. The team consists of members with varying skill sets and levels of knowledge.

All the team members got along with each other and worked well in the group; support was always offered to assist the other team members if they required it.

I am very proud to be a member of The Fighting Mongooses.

What could be improved?

This question was a little hard to answer as I could not really recall anything that needed to be improved, except our lack of knowledge on where people in the team were located and their time zones. I personally just assumed everyone was in Victoria. Which caught most of us off guard with daylight savings time and scheduling conflicts.

Yes, Assumptions make life harder, its best to assume nothing.

At least one thing that was surprising?

It was surprising to me the willingness of each team member to assist another as much as possible even on tasks they were not assigned to work on, which I thought was great as it clearly shows how effective our team was.

Another thing that surprised me is just how well we got along, just like we already had known each other for years.

At least one thing that you have learned about groups?

Teams work well when everyone gets along and shows willingness to learn and achieve the goals as a team and not as an individual.

Channon's Group Reflection

What went well?

I believe everything went well from the initial group getting together to getting the task done. The fact we organised a group early and from the get-go everyone was keen to be working as part of the group. We organized a plan right at the start and everyone had tasks set they were happy to complete which made it easy to accomplish our task.

What could be improved?

In terms of improvement would only be minor things, the only real drawback was time differences however we still managed to work around this and have everyone collaborate. When putting together meetings it may have become an issue if further meetings were required.

At least one thing that was surprising?

What I found really surprising was the ease of how it all came together, when matching 6 different people together and giving them a task with no prior knowledge of each other the whole process went smother then ever imagined.

At least one thing that you have learned about groups?

I have learnt working in this group especially that you can rely on others and you don't need to take all the stress on yourself. Working in group environments previously often there would be unresolved differences and clashing opinions. The key to this success was the communication and the agreeance of the path we were taking, and any concerns were deliberated on and successfully concluded.

Daniel's Group Reflection

What went well?

As this was the first time I'd worked in a group 100% remotely I thought the whole process went relatively smoothly and better than I'd expected. In particular I thought the assignment was broken down well and the workload was distributed evenly and efficiently. Everyone seemed to naturally move into the roles that suited them best.

What could be improved?

I think in regards to communication and meetings we improved over time once we got used to the procedures, software and assignment requirements and were more familiar with each other. For my part I could have done more preparation going into meetings to avoid needless stress because I wasn't as organised as I could have been. I probably should have read the assignment spec earlier and reread it more often so I had more confidence contributing during recorded meetings and not come off as skittish or flippant as I'm afraid I did.

At least one thing that was surprising?

I was surprised by the progress we made so quickly and the lack of any friction or even small disagreements. All in all it was a pleasant experience. I thought it was going to be a more stressful ordeal than it was though that's not to say it wasn't challenging.

At least one thing that you have learned about groups?

The initial foreign feeling fades over time - quicker than I anticipated. Communication is definitely as important as it was made out to be going into this group assignment. The sooner questions are asked and issues are raised the better. It's easy to understand that without open and frequent dialogue things could fall apart quickly and deadlines easily missed.

Jorge's Group Reflection

What went well?

We had a really good start, everyone was very committed to the assessment and happy to contribute in the best way they could, the team came together and quickly we started to delegating task to each member. Everyone worked really well for being the first time i work in an online course and made me really happy that the team members I worked are willing to help others and share their knowledge with others

What could be improved?

Think there is not too much to improve, there would be a few things in my opinion, like for example delegating specific task's or maybe working in teams, just in case if someone has a problem on how to do something specific so the other person can help right away be able to solve the issue much quicker.

At least one thing that was surprising?

How good was working with everyone. I felt like each team member was good at what they had to do. And how easy was to communicate in between us and help each other. Everybody came together really well and with a good attitude to do the best they could. While others offered their time to explain things or arrange meetings.

At least one thing that you have learned about groups?

Working in teams was great, I got to learn more from other people who could explain me how to solve some of the issues I encounter along the w ay when I was doing my research. and the same for the other team members. If there was something, we didn't know how to solve it. We brainstorm the situation until we find a solution.

Madeleine's Group Reflection

What went well?

I think we formed our group quickly which was a vital step. I believe I sent the first message to our group participants on 5 September 2020 and our group had been formed the night

before. We started to figure out our communication system soon after that. We all worked fairly evenly towards the project. We were all willing and motivated to get started, allocate work and get our individual pieces done. Each person worked hard to keep up with the group and attend as many meetings as possible. We got the correct number of meetings done, even if a few of us missed a meeting here or there.

What could be improved?

I'm not sure that there was much to be improved. We were a strong group that supported each other where we had flaws or contributed more where we had strengths. We had no areas of conflict and discussed mildly different opinions calmly to come to the most beneficial outcome. Perhaps we could have anticipated differing time zones a bit better but we sorted that out eventually. We did the best we could while learning to use MS Teams without and/much prior experience. Perhaps there were a few areas where we could have met the word counts and didn't - but I wouldn't say we are missing much in the way of value, despite the word deficit. I wish I was a little quicker to submit my individual pieces as I did lag for up to a few days here and there but caught up each time without issue. I don't believe this created an issue amongst the group but it is a good chance for me to improve in this area anyway.

At least one thing that was surprising?

It was surprising how well we did. I expected there to be areas of conflict, lack of support, lack of motivation or other limitations both inside or outside of our control. However, we did really well and I am very proud of what we did.

At least one thing that you have learned about groups?

They can work really well. If I'm being honest, I did not have high expectations for the group work but I was blown away with how much work we did, how well we communicated and how ready people were to be a part of the group.

Samuel's Group Reflection

What went well?

From the start everyone was eager to get on task and I feel we all got along well together. I initially had concerns about joining a team solely online and remote. All my concerns were alleviated as everyone collaborated and made time to work effectively together. Our team has six members all with varied levels of knowledge and skills and we were able to find roles that suited our abilities and help out other team members where necessary.

What could be improved?

Our team communicated quite clearly and there was little confusion over our direction. We set most of our tasks and planning done in the early stages of the assignment. We initially did not take into account time zones and daylight-saving time changes. This had the potential of causing scheduling issues with interstate team members however, the interstate team members were flexible, and we managed to quickly find a solution. Even though for this assignment the daylight-saving time change only caused a minor inconvenience for some, we should perhaps be more aware of such issues in future assignments.

At least one thing that was surprising?

Everyone was extremely supportive of each other and helped out however they could. Everyone was sincere and genuine in helping each other. One particular occasion of note was when Adam offered his own time on top of the assignment to teach other team members about using Git and GitHub.

At least one thing that you have learned about groups.

Morale and a positive work environment matter a great deal. Because all team members responded positively to each other, everyone did their tasks willingly. I genuinely wanted to achieve the best results for my team and worked hard. I feel others did the same.